# Online Appendix
# (Not for Publication)

## Temporal Instability of Risk Preference Among the Poor: Evidence from Payday Cycles

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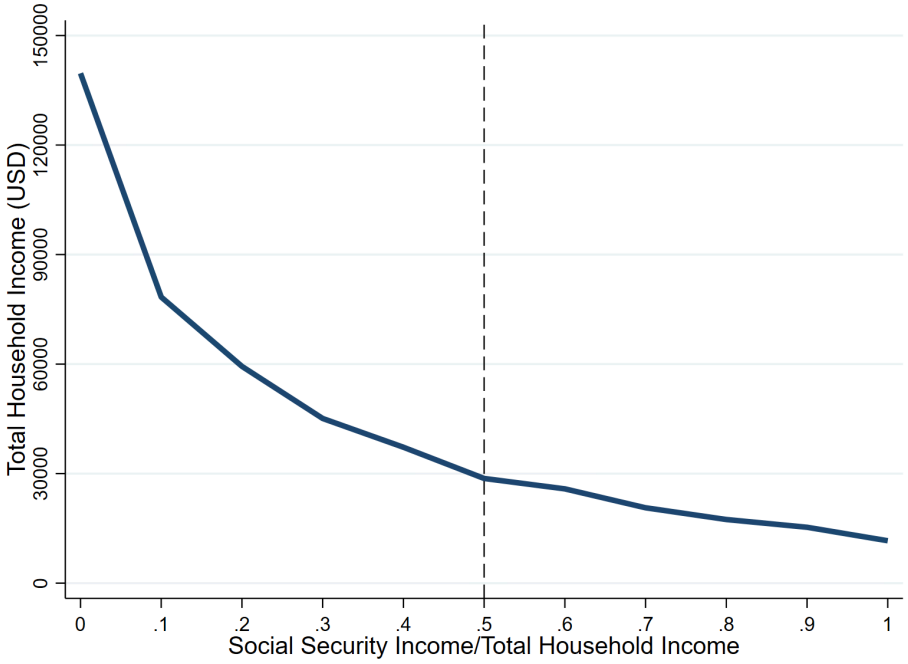
# Appendix A: Analysis for HRS (the US)

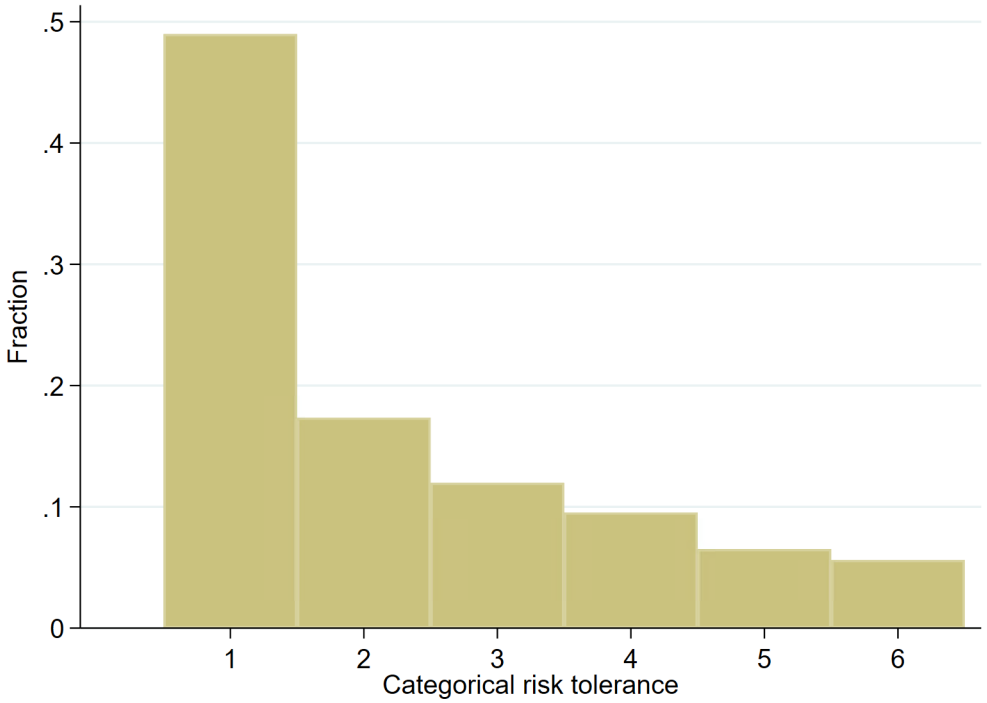
**Figure A1—Relationship between total household income and the share of Social Security income in total household income**



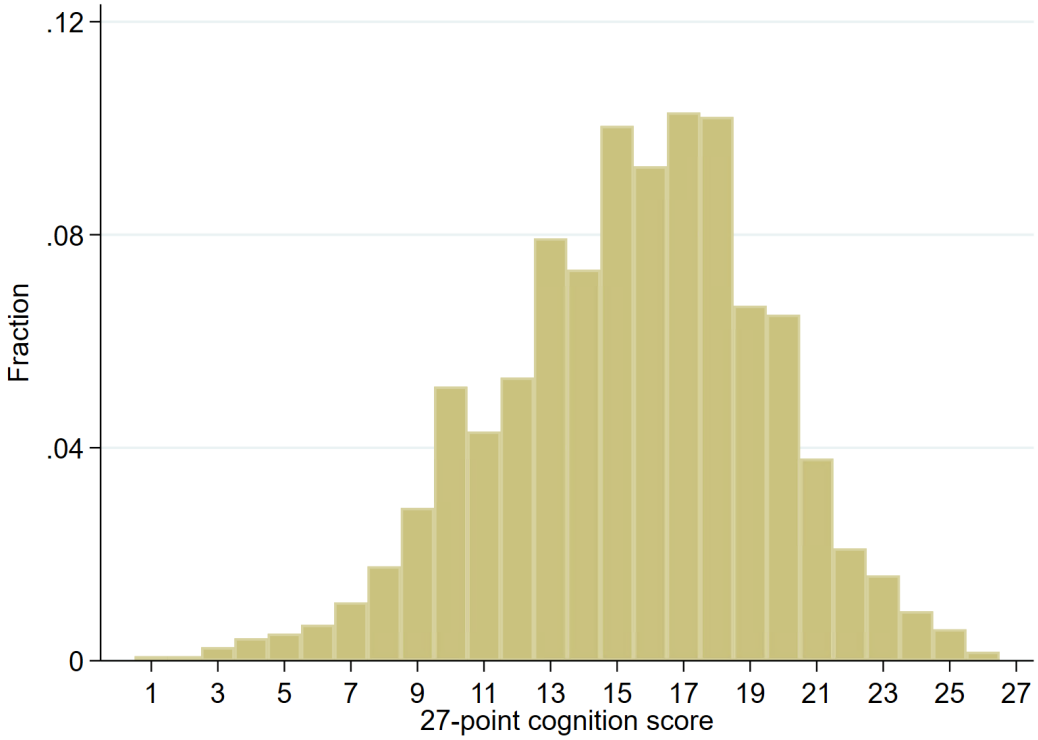

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The *x*-axis represents the share of Social Security income in total household income, and the *y*-axis, the total household income. The dotted line corresponds to an income share of at least 50% or 0.5 (which comprises 43% of the full sample).

## Figure A2—Frequency distributions

(a) Risk preferences (N=1,227)




(b) Cognition (N=1,185)




*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. Table A1 provides the relationship between the gamble response category and the downside risks that the individual accepts or rejects. See Table D1 for the questionnaires about risk preference. Cognition is a 27-point score composed of the word recall, serial sevens, and backward counting tests.

## Table A1—Categories of risk tolerance responses

| Response category | Downside risk of risky jobs | | Bounds on Risk tolerance: θ | | Fraction (%) |
|---|---|---|---|---|---|
| | Accept | Reject | Lower | Upper | |
| 1 | None | 1/10 | 0 | 0.13 | 48.98 |
| 2 | 1/10 | 1/5 | 0.13 | 0.27 | 17.36 |
| 3 | 1/5 | 1/3 | 0.27 | 0.50 | 11.98 |
| 4 | 1/3 | 1/2 | 0.50 | 1.00 | 9.54 |
| 5 | 1/2 | 3/4 | 1.00 | 3.27 | 6.52 |
| 6 | 3/4 | None | 3.27 | ∞ | 5.62 |

*Notes:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006 (N = 1,227). Respondents choose between a safe and a risky job in hypothetical scenarios. With equal chances, a risky job will double the income or reduce monthly income by a specific fraction (downside risk). Varying the downside risk on the monthly income in subsequent questions refines the measure of risk preference. Panel (a) of Figure A2 shows the frequency distributions of risk choices. At the lower bound of the risk tolerance category (#1), an individual rejects a risky job with the smallest downside risk. At the upper bound of the risk tolerance category (#6), an individual accepts the largest downside risk. Table D1 presents the questionnaire.

## Table A2—Relationship between risk tolerance and risk-taking behaviors

| | Financial stocks (share) | Financial stocks (dummy) | Drinking | Smoking |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Risk tolerance: θ | 0.042** | 0.057*** | 0.025** | 0.035** |
| | (0.012) | (0.017) | (0.011) | (0.016) |
| Constant | 0.189** | 0.356*** | 0.065*** | 0.594*** |
| | (0.011) | (0.016) | (0.009) | (0.016) |
| No of individuals | 1,227 | 1,227 | 1,185 | 1,222 |
| Mean of outcome | 0.211 | 0.387 | 0.078 | 0.613 |
| R-squared | 0.011 | 0.010 | 0.006 | 0.004 |

*Note*: The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The explanatory variable is risk tolerance. See the main text for the construction of risk preference measures. A share of financial stocks is portfolio shares of stocks and mutual funds in total financial wealth. A dummy for financial stocks takes one if the person owns any shares of stocks or mutual funds. A drinking dummy takes one if the person drinks two or more drinks almost every day in the last three months, on average. A smoking dummy takes one if the person ever smoked cigarettes. The robust standard errors are reported in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.10.

## Table A3—Test for randomization of interview dates

Sample: SS income/Total income share *above* 50 percent

| | Age | Female | Yrs. of schooling | Married | Retired | Household size | Northeast | Midwest | South | West | Good health | Poor health | African American |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Week -2 | -0.323 | -0.023 | 0.061 | 0.018 | 0.008 | 0.011 | 0.054 | 0.014 | 0.001 | -0.069 | 0.012 | -0.011 | 0.000 |
| | (0.405) | (0.061) | (0.367) | (0.037) | (0.053) | (0.029) | (0.052) | (0.056) | (0.058) | (0.043) | (0.059) | (0.057) | (0.034) |
| Week -1 | 0.193 | -0.020 | -0.399 | -0.033 | 0.028 | -0.074* | -0.063 | -0.040 | 0.167** | -0.065 | 0.086 | -0.019 | 0.015 |
| | (0.448) | (0.069) | (0.379) | (0.046) | (0.059) | (0.043) | (0.053) | (0.061) | (0.067) | (0.047) | (0.067) | (0.064) | (0.040) |
| Week +2 | 0.132 | -0.039 | -0.070 | 0.022 | 0.037 | -0.001 | -0.081* | 0.008 | 0.088 | -0.016 | -0.025 | 0.090 | 0.057 |
| | (0.399) | (0.060) | (0.364) | (0.035) | (0.051) | (0.030) | (0.046) | (0.054) | (0.057) | (0.044) | (0.056) | (0.057) | (0.037) |
| F-stat | 0.608 | 0.146 | 0.618 | 0.658 | 0.234 | 1.484 | 3.422 | 0.324 | 2.974 | 1.347 | 1.049 | 1.627 | 1.055 |
| p-value | 0.610 | 0.932 | 0.604 | 0.578 | 0.873 | 0.218 | 0.017 | 0.808 | 0.031 | 0.258 | 0.370 | 0.182 | 0.368 |
| N | 527 | 527 | 527 | 527 | 527 | 527 | 527 | 527 | 527 | 527 | 527 | 527 | 527 |

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The sample comprises individuals with a share of Social Security (SS) income of *above* 50% in the total household income. The estimates $\beta_k$ $(k = -2, -1, +2)$ from estimating an equation [1] are reported with robust standard errors in parentheses. F-stats and p-values correspond to joint null tests whereby each of the coefficients on the four-week dummies is zero.

## Table A4—Relationship between income and risk tolerance

| | Full sample | SS income/Total income share | |
|---|---|---|---|
| | | *above* 50 percent | *below* 50 percent |
| | (1) | (2) | (3) |
| Income (in 10K USD) | 0.000 | 0.051 | -0.004 |
| | (0.003) | (0.033) | (0.003) |
| Covariates | × | × | × |
| Mean of outcome | 0.121 | 0.114 | 0.127 |
| N | 1227 | 527 | 700 |
| R squared | 0.104 | 0.132 | 0.198 |

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The sample comprises individuals with a share of Social Security (SS) income of *above* 50% in total household income in column (2) and below 50% in column (3). This table reports the estimate of regressing risk tolerance measure on income. The risk tolerance is a dummy that takes one if respondents choose the highest or second-highest risk-tolerant categories (categories 5 and 6) in the gamble question (see Table A1), and zero otherwise. Income is total household income divided by the square root of the household size (either one or two). The income is further divided by 10,000. Covariates are the same as Table 3, namely age, age squared, gender, household size, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, calendar week fixed effects (FEs), year FEs, month FEs, and year-month FEs. The robust standard errors are reported in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table A5—Different thresholds: Risk tolerance

| | SS income/Total income share | | |
|---|---|---|---|
| | *above* 50 percent | *above* 40 percent | *above* 60 percent |
| | (1) | (2) | (3) |
| Week -2 | 0.044 | 0.016 | 0.052 |
| | (0.095) | (0.081) | (0.123) |
| Week -1 | 0.353** | 0.265** | 0.320* |
| | (0.139) | (0.118) | (0.165) |
| Week +2 | 0.155 | 0.123 | 0.042 |
| | (0.098) | (0.085) | (0.111) |
| Covariates | × | × | × |
| Mean of outcome | 0.514 | 0.511 | 0.495 |
| N | 527 | 681 | 380 |
| R squared | 0.135 | 0.125 | 0.168 |
| *Sample share* | *43 percent* | *56 percent* | *31 percent* |

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. Column (1) replicates the baseline results of column (2) in Table 3. The sample is limited to Social Security (SS) income/total income share *above* 40% in columns (2), and *above* 60% in column (3). The outcome is risk tolerance. See the main text for the construction of risk preference measures. The estimates $\beta_k$ ($k = -2, -1, +2$) from equation [1] are reported with robust standard errors in parentheses. The omitted category is week +1. Covariates include age, age squared, gender, household size, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, calendar week fixed effects (FEs), year FEs, month FEs, and year-month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table A6—Other robustness checks: Risk tolerance

| | Risk tolerance categories 5 or 6 | Ordered Probit | Interval regression |
|---|---|---|---|
| | (1) | (2) | (3) |
| Week -2 | -0.014 | 0.041 | 0.058 |
| | (0.038) | (0.150) | (0.208) |
| Week -1 | 0.118** | 0.404** | 0.631** |
| | (0.055) | (0.188) | (0.280) |
| Week +2 | 0.041 | 0.171 | 0.272 |
| | (0.039) | (0.148) | (0.210) |
| Covariates | × | × | × |
| Mean of outcome | 0.114 | 2.144 | - |
| N | 527 | 527 | 527 |

*Note*: The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The sample is limited to individuals with a share of Social Security (SS) income of *above* 50% in total household income. The estimates $\beta_k$ ($k = -2, -1, +2$) from equation [1] are reported with robust standard errors in parentheses. The omitted category is week +1. The outcome in column (1) is a binary measure of risk preference that takes the value of 1 if the person chose the highest or second-highest risk tolerance categories (categories 5 or 6) and 0 otherwise. The outcome in column (2) is an ordinal measure of risk preference coded from 1 for the lowest risk tolerance category to 6 for the highest category. We report the average marginal effects by using the "margins, dydx(week*) predict(xb)" command in Stata. Column (3) reports the estimates of the interval regression. Covariates include age, age squared, gender, household size, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, calendar week fixed effects (FEs), year FEs, month FEs, and year-month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table A7—Regression discontinuity analysis: Risk tolerance

| | (1) | (2) |
|---|---|---|
| Before the pension payment | 1.040*** | 1.243*** |
| | (0.271) | (0.346) |
| Bandwidth (days) | 3.226 | 2.358 |
| Covariates | × | × |
| N | 527 | 527 |

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The sample is limited to individuals with a share of Social Security (SS) income of *above* 50% in total household income. The outcome is risk tolerance. See the main text for the construction of risk preference measures. The estimates are reported with robust standard errors in parentheses. One common mean square error optimal bandwidth selector for the RD treatment effect estimator is used in column (1), and one common coverage error rate optimal bandwidth selector for the RD treatment effect estimator is used in column (2). The regression is conducted using the "rdrobust" command in Stata software, developed by Calonico et al. (2014). Covariates include age, age squared, gender, total household income, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, and calendar week fixed effects. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table A8—Robustness: Cognition

| | SS income/Total income share *above* 50 percent | | SS income/Total income share *above* 40 percent | | SS income /Total income share *above* 60 percent | |
|---|---|---|---|---|---|---|
| | Dementia | CIND+ Dementia | Dementia | CIND+ Dementia | Dementia | CIND+ Dementia |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Week -2 | -0.011 | -0.071 | 0.001 | -0.078* | -0.003 | -0.044 |
| | (0.023) | (0.053) | (0.019) | (0.044) | (0.027) | (0.066) |
| Week -1 | -0.025 | -0.089 | -0.020 | -0.070 | -0.020 | -0.106 |
| | (0.026) | (0.063) | (0.022) | (0.057) | (0.032) | (0.082) |
| Week +2 | -0.034 | -0.071 | -0.029 | -0.059 | -0.030 | -0.049 |
| | (0.024) | (0.051) | (0.019) | (0.042) | (0.030) | (0.064) |
| Covariates | × | × | × | × | × | × |
| Mean of outcome | 0.034 | 0.243 | 0.033 | 0.225 | 0.043 | 0.285 |
| N | 518 | 518 | 670 | 670 | 375 | 375 |
| R-squared | 0.308 | 0.278 | 0.284 | 0.247 | 0.347 | 0.310 |
| *Sample share* | *44 percent* | | *57 percent* | | *32 percent* | |

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. Columns (1) and (2) replicate the baseline results of columns (1) and (2) in Table 5. The sample is limited to Social Security (SS) income/total income share *above* 40% in columns (3) and (4), and *below* 60% in columns (5) and (6). The classification is based on a 27-point score composed of the word recall, serial sevens, and backward counting tests. Scores between 12 and 27 are classified as normal, between 7 and 11 as cognitive impairment, not dementia (CIND), and between 0 and 6 as dementia. The estimates $\beta_k$ ($k = -2, -1, +2$) from equation [1] are reported with robust standard errors in parentheses. The omitted category is week +1. Covariates include age, age squared, gender, household size, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, calendar week fixed effects (FEs), year FEs, month FEs, and year-month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table A9—Controlling for cognition: Risk tolerance

Outcome: Risk tolerance

| | SS income/Total income share *above* 50 percent | | |
|---|---|---|---|
| *Cognition controls* | *No* | *Yes* | *Yes* |
| | (1) | (2) | (3) |
| Week -2 | 0.041 | 0.033 | 0.028 |
| | (0.097) | (0.097) | (0.097) |
| Week -1 | 0.355** | 0.345** | 0.344** |
| | (0.140) | (0.142) | (0.143) |
| Week +2 | 0.155 | 0.147 | 0.143 |
| | (0.098) | (0.097) | (0.098) |
| Demented | | -0.112 | |
| | | (0.259) | |
| CIND | | -0.110 | |
| | | (0.100) | |
| Cognition score | | | 0.009 |
| | | | (0.011) |
| Covariates | × | × | × |
| Mean of outcome | 0.520 | 0.520 | 0.520 |
| N | 518 | 518 | 518 |
| R squared | 0.133 | 0.135 | 0.134 |

*Note*: The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The sample is limited to individuals with a share of Social Security (SS) income of *above* 50% in total household income. The outcome is risk tolerance. See the main text for the construction of risk preference measures. The estimates $\beta_k$ ($k = -2, -1, +2$) from equation [1] are reported with robust standard errors in parentheses. The omitted category is week +1. Column (2) controls for a dummy for the demented as well as CIND, and column (3) controls for the raw 27-point score of cognitive ability. Covariates include age, age squared, gender, household size, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, calendar week fixed effects (FEs), year FEs, month FEs, and year-month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table A10—Robustness: Depression

| | SS income/Total income share | | |
|---|---|---|---|
| | *above* 50 percent | *above* 40 percent | *above* 60 percent |
| | (1) | (2) | (3) |
| Week -2 | 0.028 | 0.025 | 0.051 |
| | (0.054) | (0.049) | (0.069) |
| Week -1 | 0.099** | 0.071* | 0.118* |
| | (0.049) | (0.042) | (0.062) |
| Week +2 | 0.009 | -0.032 | 0.046 |
| | (0.039) | (0.032) | (0.051) |
| Covariates | × | × | × |
| Mean of outcome | 0.156 | 0.144 | 0.178 |
| N | 506 | 648 | 365 |
| R squared | 0.258 | 0.199 | 0.319 |
| *Sample share* | *44 percent* | *57 percent* | *32 percent* |

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The sample is limited to the Social Security (SS) income/total income share of *above* 50% in column (1), *above* 40% in column (2), and *above* 60% in column (3). The outcome is a dummy that takes the value of one if the person felt depressed much of the time during the past week. The estimates $\beta_k$ ($k = -2, -1, +2$) from equation [1] are reported with robust standard errors in parentheses. The omitted category is week +1. Note that since the reference period of this question is a week from the survey date, we subtract seven days from the original distance in days and reconstruct the week dummies in equation [1] accordingly. Furthermore, we omit observations for which a reference week includes more than three days on either side of the payday to avoid the influence of the individuals who straddle the dividing line. Covariates include age, age squared, gender, household size, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, calendar week fixed effects (FEs), year FEs, month FEs, and year-month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

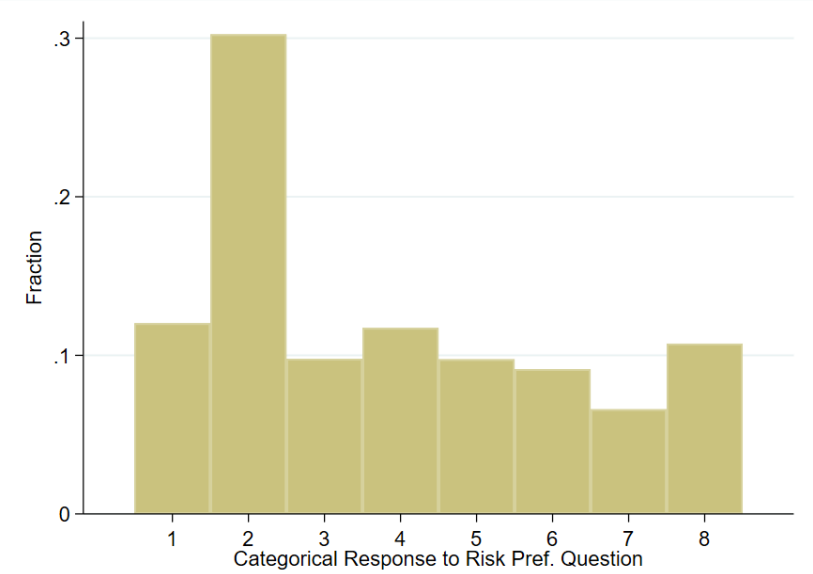
## Table A11—Robustness: Depression (without dropping)

| | SS income/Total income share | | |
|---|---|---|---|
| | *above* 50 percent | *above* 40 percent | *above* 60 percent |
| | (1) | (2) | (3) |
| Week -2 | 0.023 | 0.024 | 0.051 |
| | (0.054) | (0.048) | (0.069) |
| Week -1 | 0.081* | 0.062 | 0.118** |
| | (0.046) | (0.038) | (0.059) |
| Week +2 | 0.009 | -0.031 | 0.039 |
| | (0.038) | (0.031) | (0.051) |
| Covariates | × | × | × |
| Mean of outcome | 0.154 | 0.144 | 0.176 |
| N | 527 | 681 | 380 |
| R squared | 0.241 | 0.190 | 0.302 |
| *Sample share* | *43 percent* | *56 percent* | *31 percent* |

*Note:* The data are from the Health and Retirement Study (HRS) in 1994, 1998, 2000, 2002, and 2006. The sample is limited to the Social Security (SS) income/total income share of *above* 50% in columns (1), *above* 40% in columns (2), and *above* 60% in columns (3). The outcome is a dummy that takes the value of one if the person felt mostly depressed during the past week. The estimates $\beta_k$ ($k = -2, -1, +2$) from equation [1] are reported with robust standard errors in parentheses. The omitted category is week +1. Note that since the reference period of this question is a week from the survey date, we subtract seven days from the original distance in days and reconstruct the week dummies in equation [1] accordingly. See also Table 6 which omits observations for which the reference week includes more than three days on either side of the payday to avoid the influence of the individuals who straddle the dividing line. Covariates include age, age squared, gender, household size, self-reported health indicators, highest year of schooling, marital status, race, retirement status, MSA status dummies, calendar week fixed effects (FEs), year FEs, month FEs, and year-month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

# Appendix B: Analysis for JSTAR (Japan)

## Figure B1—Frequency distributions: Risk preferences




*Note:* The data are from the Japanese Study of Aging and Retirement (JSTAR) in 2007, 2009, 2011, and 2013 (N = 2,728). Table B1 provides the relationship between the gamble response category and the downside risks that the individual accepts or rejects. Table D2 (N= 2,705) presents the questionnaire.

## Table B1—Categories of risk tolerance responses

| Response category | Pay choices | | Bounds on Risk tolerance: θ | | Fraction (%) |
|---|---|---|---|---|---|
| | Choice 1 | Choice 2 | Lower | Upper | |
| 1 | 100% chance of an increase by 50% | | - | 0.00 | 12.02 |
| 2 | 90% chance of an increase by 50% and 10% chance of an increase by 5% | | 0.00 | 0.06 | 30.24 |
| 3 | 80% chance of an increase by 50% and 20% chance of an increase by 5% | | 0.06 | 0.08 | 9.79 |
| 4 | 70% chance of an increase by 50% and 30% chance of an increase by 5% | 100% chance of an increase by 20% | 0.08 | 0.11 | 11.73 |
| 5 | 60% chance of an increase by 50% and 40% chance of an increase by 5% | | 0.11 | 0.16 | 9.75 |
| 6 | 50% chance of an increase by 50% and 50% chance of an increase by 5% | | 0.16 | 0.25 | 9.13 |
| 7 | 40% chance of an increase by 50% and 60% chance of an increase by 5% | | 0.25 | 0.62 | 6.60 |
| 8 | - | | 0.62 | ∞ | 10.74 |

*Note*: The data are from the Japanese Study of Aging and Retirement (JSTAR) in 2007, 2009, 2011, and 2013 (N = 2,728). Respondents choose income from two scenarios where the safe option guarantees a 20% increase in income, while the risky option increases the income by either 50% or 5% with a specific probability. Varying the downside risk on risky options refines the measure of risk preference. At the upper bound of the risk tolerance category (#8), an individual accepts the largest downside risk. Figure B1 shows the frequency distributions of risk choices. Table D2 presents the questionnaire.

## Table B2—The relationship between risk tolerance and income

| | (1) | (2) |
|---|---|---|
| Income | 0.225 | -0.002 |
| | (0.264) | (0.274) |
| Covariates | | × |
| Mean of outcome | 0.173 | 0.173 |
| N | 2,705 | 2,705 |
| R squared | 0.000 | 0.048 |

*Note:* The data are from the Japanese Study of Aging and Retirement (JSTAR) in 2007, 2009, 2011, and 2013. This table reports the estimate of regressing risk tolerance measure on income. The risk tolerance is a dummy that takes one if respondents choose the most or second-most risk-tolerant categories (categories 7 and 8) in the gamble question (see Table B1), and zero otherwise. Income is total household income (measured in yen) divided by the square root of the household size (either one or two). The income is further divided by 10,000. Covariates are the same as Table 7, namely age, age squared, and dummy variables for gender, marital status, educational background, sampling cohort, working status, and good and bad health status. Time effects are related to the date of the survey interview and include dummy variables for the year, month, interactions of year and month, day of the week, number of weeks, and interactions of the day of week and number of weeks of the interview date. The robust standard errors are reported in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table B3—Descriptive statistics

| Variables | Obs | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| Risk tolerance: θ | 2,728 | 0.153 | 0.195 | 0 | 0.622 |
| Days since check arrival | 2,728 | -0.932 | 15.094 | -28 | 27 |
| Social Security Income / Household Income | 2,388 | 0.642 | 0.313 | 0 | 1 |
| Individual Characteristics: | | | | | |
| Age | 2,728 | 68.515 | 4.992 | 51 | 81 |
| Female | 2,728 | 0.510 | 0.500 | 0 | 1 |
| Education | | | | | |
| Elementary/Middle school | 2,728 | 0.310 | 0.463 | 0 | 1 |
| High School | 2,728 | 0.458 | 0.498 | 0 | 1 |
| Junior College | 2,728 | 0.039 | 0.194 | 0 | 1 |
| Vocational School | 2,728 | 0.059 | 0.235 | 0 | 1 |
| University or above | 2,728 | 0.126 | 0.332 | 0 | 1 |
| Married | 2,728 | 0.803 | 0.398 | 0 | 1 |
| Not working | 2,728 | 0.615 | 0.487 | 0 | 1 |
| Good Health | 2,728 | 0.464 | 0.499 | 0 | 1 |
| Poor Health | 2,728 | 0.167 | 0.373 | 0 | 1 |

*Note*: The data come from the Japanese Study of Aging and Retirement (JSTAR) in 2007, 2009, 2011, and 2013.

## Table B4—Test for randomization of interview dates

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Education | | | | | | | | |
| | Age | Female | Elementary /Middle school | High School | Junior College | Vocational School | University or above | Married | Not Working | Good Health | Poor Health |
| F-stat | 2.923 | 0.603 | 0.960 | 1.974 | 1.577 | 1.448 | 0.583 | 0.859 | 0.915 | 0.927 | 0.481 |
| p-value | 0.005 | 0.754 | 0.459 | 0.055 | 0.137 | 0.182 | 0.770 | 0.538 | 0.494 | 0.484 | 0.849 |

*Note:* The data are from the Japanese Study of Aging and Retirement (JSTAR) in 2007, 2009, 2011, and 2013 (N = 2,728). F-stats and p-values correspond to joint null tests whereby each coefficient on the eight-week dummies is zero.

## Table B5—Robustness checks: Risk tolerance

| | Risk tolerance categories 7 or 8 | Ordered Probit | Interval regression |
|---|---|---|---|
| | (1) | (2) | (3) |
| Week -4 | -0.057 | 0.048 | -0.022 |
| | (0.062) | (0.173) | (0.034) |
| Week -3 | -0.070 | -0.023 | -0.032 |
| | (0.076) | (0.208) | (0.042) |
| Week -2 | 0.047 | -0.012 | 0.036 |
| | (0.059) | (0.167) | (0.033) |
| Week -1 | 0.102* | 0.118 | 0.064** |
| | (0.054) | (0.153) | (0.030) |
| Week+2 | 0.015 | 0.068 | 0.006 |
| | (0.048) | (0.122) | (0.027) |
| Week +3 | -0.036 | -0.037 | -0.002 |
| | (0.057) | (0.159) | (0.032) |
| Week +4 | 0.030 | 0.043 | 0.031 |
| | (0.065) | (0.181) | (0.037) |
| Covariates | × | × | × |
| Mean of outcome | 0.173 | 3.844 | - |
| N | 2,728 | 2,728 | 2,728 |

*Note:* The data are from the Japanese Study of Aging and Retirement (JSTAR) in 2007, 2009, 2011, and 2013. The estimates $\beta_k$ ($k$ $=-4,-3,-2,-1,+2,+3,+4$) from equation [1]' are reported with robust standard errors in parentheses. The omitted category is week +1. The outcome in column (1) is a binary measure of risk preference that takes the value of 1 if the person chose the highest or second-highest risk-tolerance categories (categories 7 or 8) and 0 otherwise. The outcome in column (2) is an ordinal measure of risk preference coded from 1 for the lowest risk tolerance category to 8 for the highest category. We report the average marginal effects by using the "margins, dydx(week*) predict(xb)" command in Stata. Column (3) reports the results of interval regression. Covariates include age, age squared, and dummy variables for gender, marital status, educational background, sampling cohort, working status, and good and bad health status. Time effects are related to the date of the survey interview and include dummy variables for the year, month, interactions of year and month, day of the week, number of weeks, and interactions of the day of week and number of weeks of the interview date. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table B6—Placebo: Risk tolerance

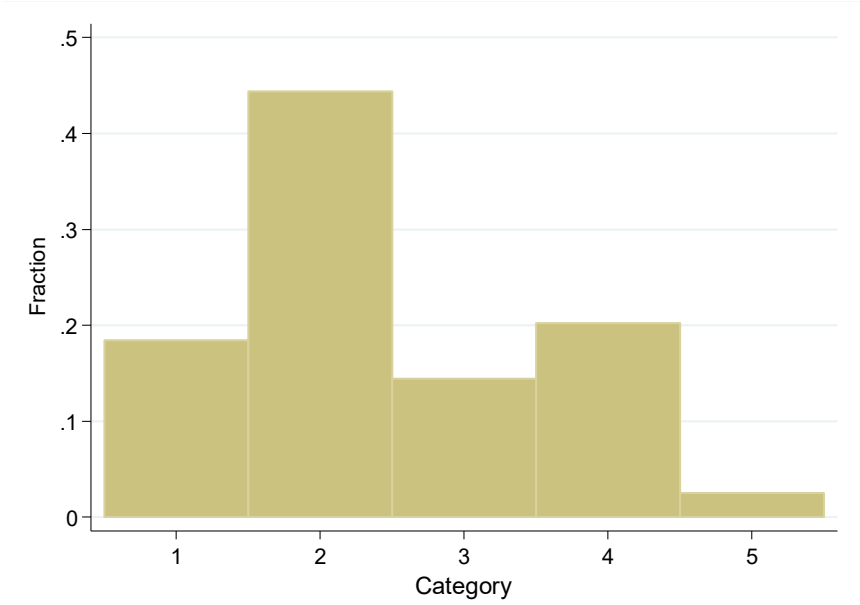
| | People aged 50 to 59 years | People aged 60+ who do not receive pension |
|---|---|---|
| | (1) | (2) |
| Week -4 | 0.041 | 0.027 |
| | (0.069) | (0.107) |
| Week -3 | -0.031 | 0.071 |
| | (0.081) | (0.138) |
| Week -2 | 0.036 | -0.069 |
| | (0.070) | (0.114) |
| Week -1 | 0.000 | -0.052 |
| | (0.069) | (0.121) |
| Week +2 | -0.044 | 0.052 |
| | (0.044) | (0.061) |
| Week +3 | 0.019 | -0.028 |
| | (0.063) | (0.087) |
| Week +4 | 0.091 | -0.054 |
| | (0.071) | (0.098) |
| Covariates | × | × |
| Mean of outcome | 0.176 | 0.150 |
| N | 750 | 311 |

*Note:* The data are from the Japanese Study of Aging and Retirement (JSTAR) in 2007, 2009, 2011, and 2013. The outcome is risk tolerance. See the main text for the construction of risk preference measures. Column (1) limits the sample to people aged 50–59, or younger than the eligibility age of 60 for pension. Column (2) limits the sample to people aged 60 and over who do not yet receive pension income. The estimates $\beta_k$ ($k = -4, -3, -2, -1, +2, +3, +4$) from equation [1]' are reported with robust standard errors in parentheses. The omitted category is week +1. Covariates include age, age squared, and dummy variables for gender, marital status, educational background, sampling cohort, working status, and good and bad health status. Time effects are related to the date of the survey interview and include dummy variables for the year, month, interactions of year and month, day of the week, number of weeks, and interactions of the day of week and number of weeks of the interview date. See the main text for the construction of risk preference measures. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

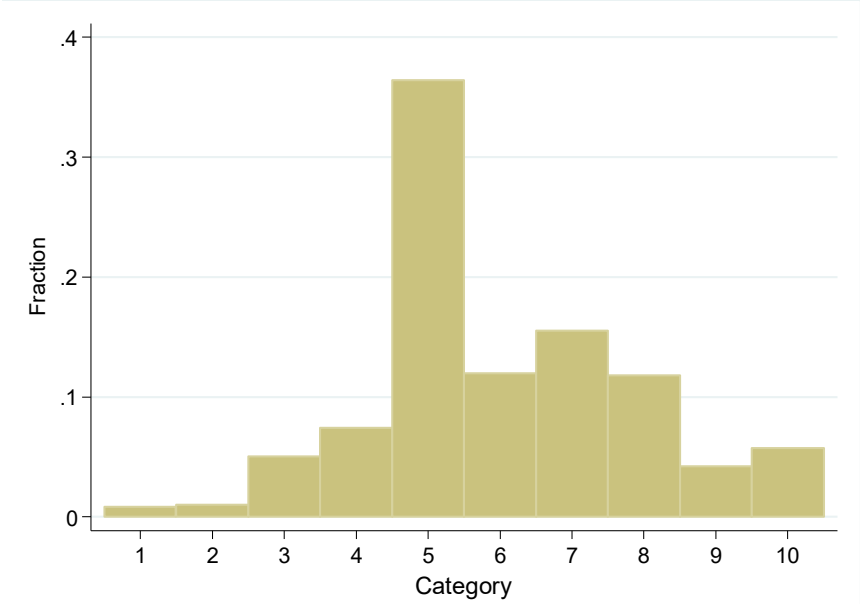
# Appendix C: Analysis for JGSS (Japan)

**Figure C1—Frequency distributions**

(a) Financial anxiety (N= 277)



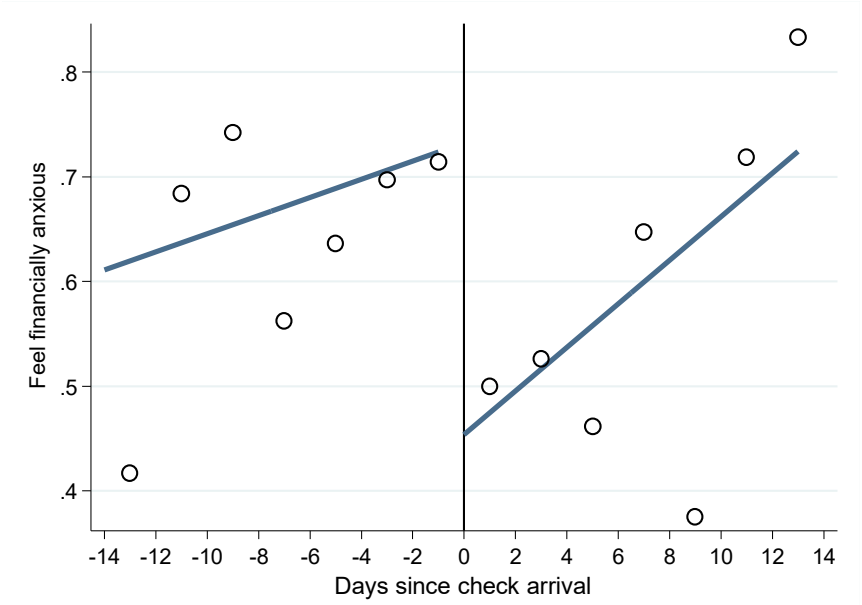

(b) Self-perceived social status (N= 593)



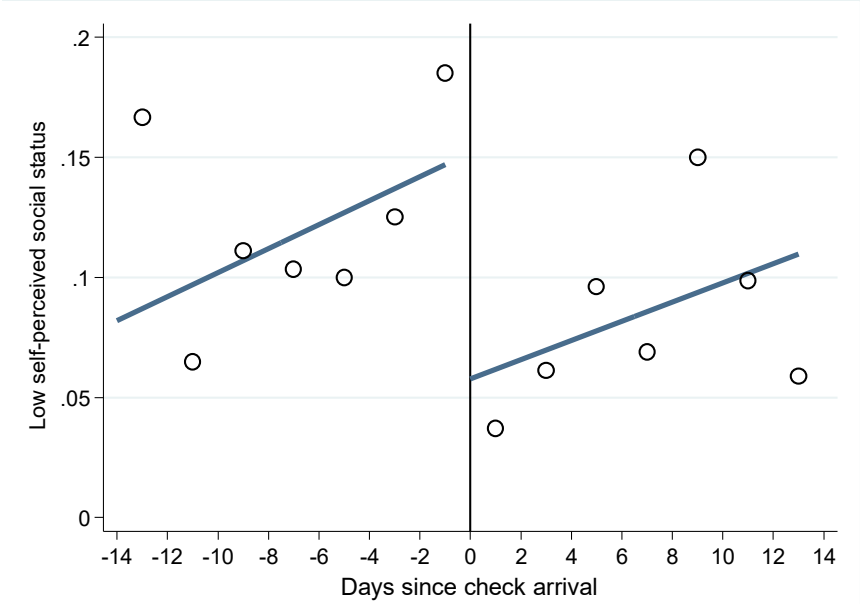

*Note:* The data are from the Japanese General Social Surveys (JGSS) in 2008. The question on financial anxiety is "Do you feel anxious about your economic situation in the future?" Categories 1 to 5 are, respectively, "I feel very anxious", "I feel somewhat anxious", "I have mixed feelings", "I don't feel anxious very much", and "I don't feel anxious at all." The question on self-perceived social status is: "If we were to divide the contemporary Japanese society into the following ten strata, which would you say you belong to?"; the categories range from 1 (top) to 10 (bottom).

## Figure C2—Outcomes before and after payday

(a) Feel financialy anxious (N=277)




(b) Low self-perceived social status (N=593)




*Note:* The data are from the Japanese General Social Surveys (JGSS) in 2008. Each plot represents the two-day average of outcomes for two weeks before and after payday. The line corresponds to the linear fit. The outcome in panel (a) is a dummy that takes the value of one if the respondents choose either "I feel very anxious" or "I feel somewhat anxious" to the question "Do you feel anxious about your economic situation in the future?" and zero otherwise. The outcome in panel (b) is a dummy that takes the value of one if the respondents choose the lowest and second-lowest categories (categories 9 and 10) to the question: "If we were to divide the contemporary Japanese society into the following ten strata, which would you say you belong to?" and zero otherwise.

## Table C1—Descriptive statistics

| Variables | Obs | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| Feel financially anxious | 277 | 0.628 | 0.484 | 0 | 1 |
| Low self-perceived social status | 593 | 0.099 | 0.3 | 0 | 1 |
| Days since check arrival | 601 | -1.501 | 7.985 | -14 | 13 |
| Individual Characteristics: | | | | | |
| Age | 601 | 71.321 | 6.678 | 60 | 89 |
| Female | 601 | 0.501 | 0.5 | 0 | 1 |
| Education | | | | | |
| Elementary/Middle school | 601 | 0.456 | 0.498 | 0 | 1 |
| High School | 601 | 0.341 | 0.474 | 0 | 1 |
| Junior College | 601 | 0.015 | 0.122 | 0 | 1 |
| Vocational School | 601 | 0.053 | 0.225 | 0 | 1 |
| University or above | 601 | 0.126 | 0.333 | 0 | 1 |
| Married | 601 | 0.752 | 0.432 | 0 | 1 |
| Not working | 601 | 0.839 | 0.368 | 0 | 1 |
| Good Health | 601 | 0.459 | 0.499 | 0 | 1 |
| Poor Health | 601 | 0.211 | 0.409 | 0 | 1 |

*Note*: The data are from the JGSS in 2008. "Feel financially anxious" is a dummy that takes the value of one if the respondents choose either "I feel very anxious" or "I feel somewhat anxious" to the question "Do you feel anxious about your economic situation in the future?" and zero otherwise. "Low self-perceived social status" is a dummy that takes the value of one if the respondents choose the lowest and second-lowest categories (categories 9 and 10) to the question "If we were to divide the contemporary Japanese society into the following ten strata, which would you say you belong to?" and zero otherwise. Only half of the respondents were asked about "Feel financially anxious".

## Table C2—Test for randomization of interview dates

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Education | | | | | | | | |
| | Age | Female | Elementary/ Middle school | High School | Junior College | Vocational School | University or above | Married | Not Working | Good Health | Poor Health |
| F-stat | 0.596 | 0.157 | 0.800 | 1.144 | 0.295 | 0.949 | 0.826 | 1.701 | 2.922 | 0.740 | 2.096 |
| p-value | 0.618 | 0.925 | 0.494 | 0.330 | 0.829 | 0.416 | 0.480 | 0.166 | 0.033 | 0.529 | 0.100 |

*Note:* The data are from the JGSS in 2008. F-stats and p-values correspond to joint null tests whereby each of the coefficients on the four-week dummies is zero.

## Table C3—Robustness checks: Potential mechanisms

| Outcome: | Feel financially anxious | Low self-perceived social status |
|---|---|---|
| | Ordered Probit | Ordered Probit |
| | (1) | (2) |
| Week -2 | 0.521** | 0.005 |
| | (0.227) | (0.132) |
| Week -1 | 0.659*** | 0.216* |
| | (0.228) | (0.130) |
| Week +2 | 0.318 | 0.134 |
| | (0.259) | (0.136) |
| Covariates | × | × |
| Mean of outcome | 3.560 | 6.000 |
| N | 277 | 593 |

*Note:* The data are from the Japanese General Social Surveys (JGSS) in 2008. The estimates $\beta_k$ ($k = -2, -1, +2$) from estimating an equation [1] are reported with robust errors in parentheses. The omitted category is week +1. The outcome in column (1) is an ordinal measure of financial anxiety coded from 1 for "I don't feel anxious at all" to 5 for "I feel very anxious" to the question "Do you feel anxious about your economic situation in the future?". The outcome in column (2) is an ordinal measure of position in the society coded from 1 for "top" to 10 for "bottom" to the question, "If we were to divide the contemporary Japanese society into the following ten strata, which would you say you belong to?" Covariates include dummy variables for age, gender, marital status, educational background, working status, good and bad health status, region fixed effects (FEs), and month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

## Table C4—Placebo: Potential mechanisms

| Outcome: | Feel financially anxious | | Low self-perceived social status | |
|---|---|---|---|---|
| | OLS | Probit | OLS | Probit |
| | (1) | (2) | (3) | (4) |
| Week -2 | 0.122 | 0.101 | 0.024 | 0.028 |
| | (0.091) | (0.082) | (0.044) | (0.040) |
| Week -1 | -0.043 | -0.030 | -0.000 | 0.009 |
| | (0.103) | (0.071) | (0.039) | (0.038) |
| Week +2 | 0.084 | 0.088 | -0.033 | -0.051 |
| | (0.088) | (0.070) | (0.028) | (0.036) |
| Covariates | × | × | × | × |
| Mean of outcome | 0.787 | 0.789 | 0.068 | 0.081 |
| N | 221 | 218 | 428 | 358 |
| R squared | 0.216 | - | 0.118 | - |

*Note:* The data are from the Japanese General Social Surveys (JGSS) in 2008. The sample is limited to people aged 50–59 who do not receive a pension benefit. The estimates $\beta_k$ ($k = -2, -1, +2$) from estimating an equation [1] are reported with robust standard errors in parentheses. The omitted category is week +1. The outcome in column (1) is a dummy that takes the value of one if the respondents choose either "I feel very anxious" or "I feel somewhat anxious" to the question "Do you feel anxious about your economic situation in the future?" and zero otherwise. The outcome in column (2) is a dummy that takes the value of one if the respondents choose the lowest and second-lowest categories (categories 9 and 10) to the question "If we were to divide the contemporary Japanese society into the following ten strata, which would you say you belong to?" and zero otherwise. Covariates include dummy variables for age, gender, marital status, educational background, working status, good and bad health status, region fixed effects (FEs), and month FEs. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

# Appendix D: Data Appendix

## Table D1—Questionnaire for the HRS

Question 0:
Suppose that you are the only income earner in the family. Your doctor recommends that you move because of allergies, and you have to choose between two possible jobs.
The first would guarantee your current total family income for life. The second is possibly better paying, but the income is also less certain. There is a 50-50 chance the second job would double your total lifetime income and a 50-50 chance that it would cut it by a third. Which job would you take -- the first job or the second job?

1. FIRST JOB → to Question C
2. SECOND JOB → to Question A
8. Don't know / Not available → End
9. Refuse → End

Question A:
Suppose the chances were 50-50 that the second job would double your lifetime income, and 50-50 that it would cut it in half. Would you take the first job or the second job?

1. FIRST JOB → End
2. SECOND JOB → to Question B
8. Don't know / Not available → End
9. Refuse → End

Question B:
Suppose the chances were 50-50 that the second job would double your lifetime income and 50-50 that it would cut it by seventy-five percent. Would you take the first job or the second job?

1. FIRST JOB → End
2. SECOND JOB → End
8. Don't know / Not available → End
9. Refuse → End

Question C:
Suppose the chances were 50-50 that the second job would double your lifetime income and 50-50 that it would cut it by twenty percent. Would you take the first job or the second job?

1. FIRST JOB → to Question D
2. SECOND JOB → End
8. Don't know / Not available → End
9. Refuse → End

Question D:
Suppose the chances were 50-50 that the second job would double your lifetime income and 50-50 that it would cut it by 10 percent. Would you take the first job or the second job?

1. FIRST JOB → End
2. SECOND JOB → End
8. Don't know / Not available → End
9. Refuse → End

## Table D2—Questionnaire for JSTAR

Question: Suppose how you are paid at work were to change next month only, which of the following options would you prefer? Please assume that the amount of your pay is not related to your ability or effort and that this change will be in effect for the next month only.

| Choice 1 | Choice 2 |
|---|---|
| 100% chance of an increase by 50% | 100% chance of an increase by 20% |
| 90% chance of an increase by 50% and 10% chance of an increase by 5% | |
| 80% chance of an increase by 50% and 20% chance of an increase by 5% | |
| 70% chance of an increase by 50% and 30% chance of an increase by 5% | |
| 60% chance of an increase by 50% and 40% chance of an increase by 5% | |
| 50% chance of an increase by 50% and 50% chance of an increase by 5% | |
| 40% chance of an increase by 50% and 60% chance of an increase by 5% | |